

C. Remarks

This Response is a submission under 37 C.F.R. § 1.114 in connection with a Request for Continued Examination (RCE).

In the office action, claims 17, 19, 98-101, 103, 125, 126, and 128 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Moravvej-Farshi *et al.* ("Novel Self-Aligned Polysilicon-Gate MOSFETS with Polysilicon Source and Drain," Solid State Electronics, Vol. 30, No. 10, 1987, pp. 1053-1062) in view of U.S. Patent 5,319,232 to Pfiester. Furthermore, claim 102 stands rejected under § 103(a) as being unpatentable over Moravvej-Farshi in view of Pfiester and in further view of U.S. Patent 6,130,482 to lio *et al.* Applicants respectfully traverse the rejections as follows.

Claims 17 and 98-103

Applicants have amended claim 17 to recite that the transistor formed on a substrate assembly includes:

a first pocket implant junction located in said substrate assembly and comprising an excess amount of dopant, wherein said first pocket implant junction is characterized by a non-uniform dopant profile and extends under a first portion of said source and under a first portion of said gate; [and]

a second pocket implant junction located in said substrate assembly and comprising an excess amount of dopant, wherein said second pocket implant junction is characterized by a non-uniform dopant profile and extends under a first portion of said drain and under a second portion of said gate.

Support for this amendment may be found throughout the specification and figures as filed, such as, for example, at page 6, line 23 through page 7, line 5, and in Figures 7-11.

Applicants submit that a *prima facie* case of obviousness under 35 U.S.C. §103(a) requires, among other things, that the cited references, when combined, teach or suggest every element of the claim. See MPEP §2142. Applicants submit that the Office has not established a *prima facie* case of obviousness because not all elements of claim 17 are taught or suggested by the cited references.

More specifically, Applicants submit that Moravvej-Farshi and Pfiester, either alone or in combination, fail to teach or suggest, among other things, a transistor formed on a substrate assembly includes that includes:

a first pocket implant junction located in said substrate assembly and comprising an excess amount of dopant, wherein said first pocket implant junction is characterized by a non-uniform dopant profile and extends under a first portion of said source and under a first portion of said gate; [and]

a second pocket implant junction located in said substrate assembly and comprising an excess amount of dopant, wherein said second pocket implant junction is characterized by a non-uniform dopant profile and extends under a first portion of said drain and under a second portion of said gate,

as recited in claim 17.

Applicants submit that Moravvej-Farshi discloses a technique for self-aligning a polysilicon gate in devices having polysilicon source and drain regions. See, e.g., Abstract. As conceded by the Examiner at pages 2-3 of the office action, neither this technique nor device structures fabricated thereby teach or suggest “a first pocket implant junction” and “a second pocket implant junction,” as recited in claim 17.

Applicants submit that Pfiester discloses transistors 10, 11 wherein lightly doped drain (LDD) regions 28 are used to reduce hot carrier injection effects. See, e.g., column 1, lines 24-29, col. 3, lines 36-59, LDD regions 28 of Figures 1D, 1E, and 3, and

LDD regions 38 of Figure 4. At page 3 of the office action, the Examiner contends that the LDD regions 28 of Figure 1E teach “a first pocket implant junction” and “a second pocket implant junction,” as recited in claim 17. Applicants respectfully disagree for at least the following reasons.

First, Applicants submit that one skilled in the relevant art would not attribute the same meaning to the term “LDD region” of Pfister and the claim term “pocket implant junction.” Consistent with its usage in Pfister, the term “LDD region” would be understood by one skilled in the relevant art as relating to a device structure comprising a lightly doped drain region used to increase hot carrier reliability. The term “pocket implant junction,” alternatively referred to using the terms “pocket implant” or “halo implant,” would be understood by one skilled in the relevant art as denoting a device structure for introducing an excess dopant concentration at the source and drain junctions for the purpose of suppressing punchthrough effects. As the device structures represented by these terms are well-known and readily distinguished based on their respective features and function, Applicants submit that one skilled in the relevant art would not use the terms interchangeably and thus would not attribute the same meaning to the terms, as does the Examiner. Applicants therefore submit that the LDD regions 28 of Pfister do not teach or suggest features equivalent to “a first pocket implant junction” and “a second pocket implant junction,” as recited in claim 17.

Second, notwithstanding the difference in meaning between the term “LDD region” and the claim term “pocket implant junction” that would be apparent to one skilled in the relevant art, the amendments to claim 17 contained herein clarify the physical differences between these device structures. For example, Applicants have amended claim 17 to recite that the first pocket implant junction “compris[es] an excess

amount of dopant, wherein said first pocket implant junction is characterized by a non-uniform dopant profile and extends under a first portion of said source and under a first portion of said gate.” Applicants have similarly amended claim 17 to recite that the second pocket implant junction “compris[es] an excess amount of dopant, wherein said second pocket implant junction is characterized by a non-uniform dopant profile and extends under a first portion of said drain and under a second portion of said gate.”

Applicants submit that Pfiester nowhere discloses that the LDD regions 28, identified by the Examiner as equivalent to the first and second pocket implant junctions, include either “an excess amount of dopant” or a “non-uniform dopant profile.” Additionally, Applicants submit that Pfiester in fact teaches away from the first and second pocket implant junctions extending under first and second portions of the gate, as recited in claim 17. In particular, to reduce gate-to-source and gate-to-drain capacitance, Pfiester explicitly discloses the use of dielectric regions 20 and reduced outdiffusion to keep the LDD regions 28 “from substantially forming or subsequently and substantially diffusing underneath the gate 16,” See, *e.g.*, column 3, lines 36-59. This teaching is consistent with the transistor 10 shown in Figure 1E of Pfiester, in which the LDD regions 28 do not extend underneath the gate 16.

For at least the above reasons, Applicants submit that claim 17, as well as claims 98-103 depending therefrom, are nonobvious over the cited references, either alone or in combination. See MPEP §2143.03 (stating that if an independent claim is nonobvious under §103(a), then any claim depending therefrom is nonobvious). Accordingly, Applicants respectfully request that the §103 (a) rejections of claims 17 and 98-103 be withdrawn.

Claims 125-126

Claim 125 is directed to a transistor formed on a substrate assembly and has been amended in a manner similar to claim 17. Applicants have also amended dependent claim 126 to conform to the amendment of claim 125, from which it depends. Therefore, for reasons analogous to those presented above with respect to claim 17, Applicants submit that claim 125, as well as claim 126 depending therefrom, are nonobvious over the cited references. Applicants therefore respectfully request that the § 103(a) rejections of claims 125-126 be withdrawn.

Claim 128

Claim 128 is directed to a transistor formed on a substrate assembly and has been amended to include:

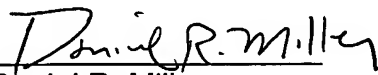
a halo implant structure located in said substrate assembly and comprising a first pocket implant junction and a second pocket implant junction, wherein said first pocket implant junction includes an excess amount of dopant and extends under a first edge of the gate, wherein said second pocket implant junction includes an excess amount of dopant and extends under a second edge of the gate, and wherein the first and second implant junctions are each characterized by a non-uniform dopant profile.

Support for this amendment may be found throughout the specification and figures as filed, such as, for example, at page 6, line 23 through page 7, line 5, and in Figures 7-11. For reasons analogous to those presented above with respect to claim 17, Applicants submit that claim 128 is nonobvious over the cited references. Applicants therefore respectfully request that the § 103(a) rejection of claim 128 be withdrawn.

D. Conclusion

Applicants respectfully request issuance of a Notice of Allowance for the subject application. If the Examiner is of the opinion that the subject application is in condition for disposition other than allowance, the Examiner is respectfully requested to contact the undersigned representative at the telephone number listed below, in order that the Examiner's concerns may be expeditiously addressed.

Respectfully submitted,


Daniel R. Miller
Registration No. 52,030

KIRKPATRICK & LOCKHART LLP
Henry W. Oliver Building
535 Smithfield Street
Pittsburgh, Pennsylvania 15222-2312
Telephone: (412) 355-6773
Facsimile: (412) 355-6501
Customer No. 26285